

1 **Amendments to the Claims:** The listing of claims below replaces
2 prior versions of claims in the application:

3
4 1-6 (Canceled)

5
6 7. (Currently Amended) A data mapping method executed by a
7 computing device, comprising:
8 partitioning each dimension in a multidimensional (MD) feature
9 space into a plurality of intervals;
10 identifying an interval in each dimension that overlaps a query point;
11 finding one or more MD data objects coupled to the MD feature
12 space that match all of the identified intervals; and
13 evaluating a first MD data object that matches all of the identified
14 intervals to determine whether the first MD data object overlaps the query point,
15 ~~A method as defined in claim 1,~~ wherein the act of finding includes,
16 ~~comprises:~~
17 for each interval, forming an associated data structure that indicates the MD
18 data objects that match the interval; and
19 processing each data structure associated with an identified interval
20 to produce a set of MD data objects, each MD data object in the set matching each
21 of the identified intervals.

22
23 8. (Original) A method as defined in claim 7, wherein each data
24 structure comprises a bit vector index.
25

1 9. (Original) A method as defined in claim 8, wherein each bit
2 vector index comprises a plurality of bits and wherein each bit in a bit vector
3 corresponds to a single MD data object.

4
5 10. (Original) A method as defined in claim 9, wherein a hyper-
6 rectangle is associated with each MD data object and wherein each bit in a bit
7 vector index indicates whether the hyper-rectangle corresponding thereto overlaps
8 the corresponding interval

9
10 11. (Original) A method as defined in claim 8, wherein the act of
11 processing comprises logically ANDing the bit vector indices associated with all
12 selected intervals.

13
14 12-13 (Canceled)

15
16 14. (Allowed) A computer-readable medium having computer-
17 executable instructions for performing acts comprising:
18 partitioning each of a plurality of dimensions in a multidimensional (MD)
19 feature space into a plurality of intervals;
20 for each interval, forming an associated data structure that indicates which
21 of a plurality of MD data objects coupled to the MD feature space match the
22 interval;
23 receiving a query point and selecting an interval in each dimension that is
24 overlapped by the query point;

1 processing each data structure associated with a selected interval to
2 determine a set of MD data objects; and
3 determining a subset of the MD data objects that overlap the query point.
4

5 15. (Allowed) A computer-readable medium as defined in claim 14,
6 wherein each data structure comprises a bit vector index.
7

8 16. (Allowed) A computer-readable medium as defined in claim 15,
9 wherein the act of processing comprises logically ANDing all of the bit vector
10 indices to determine the set of MD data objects.
11

12 17. (Allowed) A computer-readable medium as defined in claim 15,
13 wherein each bit vector index has a plurality of bits and each bit in a bit vector
14 corresponds to a MD data object coupled to the MD feature space.
15

16 18. (Allowed) A computer-readable medium as defined in claim 15,
17 wherein each bit vector index has a plurality of bits, each bit in a bit vector
18 corresponds to a single hyper-rectangle and indicates whether the corresponding
19 hyper-rectangle overlaps the interval associated with the data structure.
20

21 19. (Allowed) A computer-readable medium as defined in claim 14,
22 wherein the act of partitioning comprises partitioning each dimension into a
23 number of disjoint intervals.
24
25

1 20. (Allowed) A computer-readable medium as defined in claim 14,
2 wherein at least one interval is bounded by two interval dividers.

3
4 21. (Allowed) A computer-readable medium as defined in claim 14,
5 wherein at least one interval is unbounded in one direction along a dimension.

6
7 22. (Allowed) A computer-readable medium as defined in claim 14,
8 wherein at least one interval of a first of the plurality of dimensions is bound by an
9 interval dividers and wherein the at least one interval divider is selected in
10 accordance with $\text{FirstIDSj} = j * [(2 * |S|) / m] + j$, where FirstIDSj represents the
11 location of the at least one interval divider along the first dimension, m is a
12 selected number of interval dividers along the first dimension, $1 \leq j \leq (2 * |S|) \% m$,
13 and |S| equals a number of hyper-rectangles coupled to the MD feature space.

14
15 23. (Allowed) A computer-readable medium as defined in claim 14,
16 wherein at least one interval of a first of the plurality of dimensions is bound by an
17 interval divider and wherein the at least one interval divider is selected according
18 to $\text{RemainingIDSj} = j * [(2 * |S|) / m] + (2 * |S|) \% m$, where RemainingIDSj represents
19 the location of the interval divider along the first dimension, m is a selected
20 number of interval dividers along the first dimension, $(2 * |S|) \% m + 1 \leq j \leq m$, and
21 |S| equals a number of hyper-rectangles coupled to the MD feature space.

22
23 24-31 (Canceled)